Space Weather Forecast

Issued on Wednesday 27 November 2024 at 01:00 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate to High Solar Activity expected with Moderate-flares likely. G1/G2 Minor-Moderate Geomagnetic Storm expected 28 Nov.

Analysis of Space Weather Activity over past 24 hours

Solar Activity:

Low activity observed in the past 24 hours, with only Common-class flares observed, mostly from a complex and large sunspot region in the southeast quadrant.

There are currently nine sunspot regions on the visible disc, two of which are unnumbered. The two largest spot regions are both in the southeast, approaching centre-disc. Both these regions are magnetically complex, although some fading of their intermediate spots have been observed. A region in the southwest has seen its trailing spots consolidating into a larger region of mixed polarity, indicating an increase in magnetic complexity. A new region has emerged over the northeast limb, although this is currently difficult to analyse for any complexity due to the viewing angle. This region was responsible for a near-Strong flare flare on 25 Nov as it rounded the limb.

There is currently one likely Earth-directed CME (coronal mass ejection) during the period. A filament eruption in the southwest led to an associated CME being ejected from the Sun. This has been analysed as Earth-directed with an impact arrival time likely during the UTC morning of 28 Nov (Day 2).

Solar Wind / Geomagnetic Activity: Solar winds started the period at Slightly Elevated levels, just above 400km/s, due to a weak fast wind influence from a coronal hole, before declining to the current background levels, near 350km/s. The Interplanetary Magnetic Field was Weak throughout. The north-south component, Bz, varied weakly between and was mostly positive orientated. Geomagnetic activity was Quiet (Kp0-2).

Energetic Particles / Solar Radiation: Solar Radiation remained at Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be Moderate, with occasional Moderate-class flares likely and a slight chance of isolated Strong flares, primarily from the large regions in the southeast disc, or a returning region currently located close to the northeast limb.

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 370 900 0100 Email: enquiries@metoffice.gov.uk

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Solar Wind / Geomagnetic Activity: A CME (coronal mass ejection) that left the Sun late on 25 Nov from the southwest disc is likely to affect Earth on Day 2 (28 Nov). Solar wind speeds are currently at Background levels and are expected to remain so during Day 1 (27 Nov). Solar winds are likely to increase to Elevated levels following the CME arrival on Day 2 (Nov 28), before gradually declining by Day 4 (30 Nov) as CME influences begin to wane.

Geomagnetic activity is expected to be mainly Quiet to Unsettled (Kp0-3) at first. Upon arrival of the CME on Day 3 (28 Nov), G1/G2 Minor/Moderate Geomagnetic Storms are expected, with a slight chance of G3/Major Geomagnetic Storm intervals. Enhanced conditions are likely to persist into Day 4 (29 Nov).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is expected to persist at Background levels, with a slight but increasing chance of Solar Radiation storms occurring later in the period, mainly from the large sunspot regions in the southeast.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	10	80	60	10
Strong	G3	No	1	20	10	1
Severe	G4	No	1	5	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	No	60	60	60	60
Very Active	R3-R5 (X Class)	No	15	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	15	15	20	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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